



SEQUENCE LISTING

<110> Queen, Cary L.

Selick, Harold E.

<120> IMPROVED HUMANIZED IMMUNOGLOBULINS

<130> 011823-002660US

<140> US 09/718,998

<141> 2000-11-22

<150> US 08/484,537

<151> 1995-06-07

<150> US 07/634,278

<151> 1990-12-19

<150> US 07/590,274

<151> 1990-09-28

<150> US 07/310,252

<151> 1989-02-13

<150> US 07/290,975

<151> 1988-12-28

<160> 113

<170> PatentIn version 3.1

<210> 1

<211> 106

<212> PRT

<213> Mus sp.

<400> 1

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Glu	Lys	Val	Thr	Ile	Thr	Cys	Ser	Ala	Ser	Ser	Ser	Ile	Ser	Tyr	Met
			20					25					30		

His	Trp	Phe	Gln	Gln	Lys	Pro	Gly	Thr	Ser	Pro	Lys	Leu	Trp	Ile	Tyr
		35					40					45			

Thr	Thr	Ser	Asn	Leu	Ala	Ser	Gly	Val	Pro	Ala	Arg	Phe	Ser	Gly	Ser
	50					55					60				

Gly	Ser	Gly	Thr	Ser	Tyr	Ser	Leu	Thr	Ile	Ser	Arg	Met	Glu	Ala	Glu
65					70					75					80

Asp	Ala	Ala	Thr	Tyr	Tyr	Cys	His	Gln	Arg	Ser	Thr	Tyr	Pro	Leu	Thr
				85					90					95	

Phe	Gly	Ser	Gly	Thr	Lys	Leu	Glu	Leu	Lys
			100					105	

<210> 2

<211> 107

<212> PRT

<213> Homo sapiens

<400> 2

Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Thr	Leu	Ser	Ala	Ser	Val	Gly
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Asp	Arg	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Gln	Ser	Ile	Asn	Thr	Trp
			20					25					30		

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Met  
 35 40 45

Tyr Lys Ala Ser Ser Leu Glu Ser Gly Val Pro Ser Arg Phe Ile Gly  
 50 55 60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro  
 65 70 75 80

Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Ser Asp Ser Lys  
 85 90 95

Met Phe Gly Gln Gly Thr Lys Val Glu Val Lys  
 100 105

<210> 3

<211> 116

<212> PRT

<213> Mus sp.

<400> 3

Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Leu Ala Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr  
 20 25 30

Arg Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile  
 35 40 45

Gly Tyr Ile Asn Pro Ser Thr Gly Tyr Thr Glu Tyr Asn Gln Lys Phe  
 50 55 60

Lys Asp Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr  
 65 70 75 80

Met Gln Leu Ser Ser Leu Thr Phe Glu Asp Ser Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Gly Gly Gly Val Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu  
 100 105 110

Thr Val Ser Ser

115

<210> 4

<211> 117

<212> PRT

<213> Homo sapiens

<400> 4

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Arg Ser  
20 25 30

Ala Ile Ile Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
35 40 45

Gly Gly Ile Val Pro Met Phe Gly Pro Pro Asn Tyr Ala Gln Lys Phe  
50 55 60

Gln Gly Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Phe Tyr Phe Cys  
85 90 95

Ala Gly Gly Tyr Gly Ile Tyr Ser Pro Glu Glu Tyr Asn Gly Gly Leu  
100 105 110

Val Thr Val Ser Ser  
115

<210> 5

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> Variable region of the PDL humanized anti-Tac antibody heavy chain

<400> 5

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr  
20 25 30

Arg Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Ile  
35 40 45

Gly Tyr Ile Asn Pro Ser Thr Gly Tyr Thr Glu Tyr Asn Gln Lys Phe  
50 55 60

Lys Asp Lys Ala Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Gly Gly Gly Val Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val  
100 105 110

Thr Val Ser Ser  
115

<210> 6

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> Variable region of the CDR-only humanized anti-Tac antibody heavy  
chain

<400> 6

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Ser Tyr  
20 25 30

Arg Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met

	35		40		45											
Gly	Tyr	Ile	Asn	Pro	Ser	Thr	Gly	Tyr	Thr	Glu	Tyr	Asn	Gln	Lys	Phe	
	50					55					60					
Lys	Asp	Arg	Val	Thr	Ile	Thr	Ala	Asp	Glu	Ser	Thr	Asn	Thr	Ala	Tyr	
65					70					75					80	
Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Phe	Tyr	Phe	Cys	
				85					90					95		
Ala	Gly	Gly	Gly	Gly	Val	Phe	Asp	Tyr	Glu	Tyr	Asn	Gly	Gly	Leu	Val	
			100					105					110			
Thr	Val	Ser	Ser													
		115														

<210> 7

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Variable region of the PDL humanized anti-Tac antibody light chain

<400> 7

Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Thr	Leu	Ser	Ala	Ser	Val	Gly
1				5					10					15	

Asp	Arg	Val	Thr	Ile	Thr	Cys	Ser	Ala	Ser	Ser	Ser	Ile	Ser	Tyr	Met
			20					25					30		

His	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	Leu	Leu	Ile	Tyr
		35					40					45			

Thr	Thr	Ser	Asn	Leu	Ala	Ser	Gly	Val	Pro	Ala	Arg	Phe	Ser	Gly	Ser
	50					55					60				

Gly	Ser	Gly	Thr	Glu	Phe	Thr	Leu	Thr	Ile	Ser	Ser	Leu	Gln	Pro	Asp
65					70					75					80

Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	His	Gln	Arg	Ser	Thr	Tyr	Pro	Leu	Thr
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

85

90

95

Phe Gly Gln Gly Thr Lys Val Glu Val Lys  
                   100                  105

<210> 8

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Variable region of the CDR-only humanized anti-Tac antibody light chain

<400> 8

Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly  
 1                  5                  10                  15

Asp Arg Val Thr Ile Thr Cys Ser Ala Ser Ser Ser Ile Ser Tyr Met  
                   20                  25                  30

His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Met Tyr  
                   35                  40                  45

Thr Thr Ser Asn Leu Ala Ser Gly Val Pro Ser Arg Phe Ile Gly Ser  
                   50                  55                  60

Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro Asp  
 65                  70                  75                  80

Asp Phe Ala Thr Tyr Tyr Cys His Gln Arg Ser Thr Tyr Pro Leu Thr  
                   85                  90                  95

Phe Gly Gln Gly Thr Lys Val Glu Val Lys  
                   100                  105

<210> 9

<211> 443

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence encoding heavy chain variable region of CDR-only humanized anti-Tac antibody including signal sequence

<400> 9

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cactctcagg tccagcttgt ccagtctggg gctgaagtca agaaacctgg ctcgagcgtg      120
aaggtctcct gcaaggcttc tggcgggacc ttttctagct acaggatgca ctgggtaagg      180
cagggcccctg gacaggggtct ggaatggatg ggatatatta atccgtcgac tgggtatact      240
gaatacaatc agaagttcaa ggacaggggtc acaattactg cagacgaatc caccaataca      300
gcctacatgg aactgagcag cctgagatct gaggacaccg cattctatct ctgtgcaggg      360
gggtgggggag tctttgacta cgaatacaat ggagggctgg tcacagtctc ctcaggtagag      420
tccttaaaac ctctagacga tat                                         443
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<210> 10

<211> 411

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence encoding light chain variable region of CDR-only humanized anti-Tac antibody including signal sequence

<400> 10

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tcaaccggag atattcagat gaccagctct ccatctaccc tctctgctag cgtcggggat      120
agggtcacca taacctgctc tgccagctca agtataagtt acatgcactg gtaccagcag      180
aagccaggca aagctcccaa gcttctaatt tataccacat ccaacctggc ttctggagtc      240
ccttctcgct tcattggcag tggatctggg accgagttca ccctcacaat cagctctctg      300
cagccagatg atttcgccac ttattactgc catcaaagga gtacttacct actcacgttc      360
ggtcagggga ccaaggtgga ggtcaaacgt aagtacactt ttctagatat a              411
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<210> 11

<211> 29

<212> DNA



<213> Artificial Sequence

<220>

<223> Primer mc045

<400> 11  
taatctagaa ttcccccccc cccccccc

29

<210> 12

<211> 46

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer mc045

<400> 12  
tatagagctc aagcttggat ggtgggaaga tggatacagt tgggtgc

46

<210> 13

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer mc047

<400> 13  
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<210> 14

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> Anti-Tac heavy chain amino acid sequence

<400> 14

Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Leu Ala Lys Pro Gly Ala  
1 5 10 15

Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr  
20 25 30

Arg Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile  
35 40 45

Gly Tyr Ile Asn Pro Ser Thr Gly Tyr Thr Glu Tyr Asn Gln Lys Phe  
50 55 60

Lys Asp Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr  
65 70 75 80

Met Gln Leu Ser Ser Leu Thr Phe Glu Asp Ser Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Gly Gly Gly Val Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu  
100 105 110

Thr Val Ser Ser  
115

<210> 15

<211> 117

<212> PRT

<213> Artificial Sequence

<220>

<223> Eu heavy chain amino acid sequence

<400> 15

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Arg Ser  
20 25 30

Ala Ile Ile Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
35 40 45

Gly Gly Ile Val Pro Met Phe Gly Pro Pro Asn Tyr Ala Gln Lys Phe  
50 55 60

Gln Gly Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Phe Tyr Phe Cys  
85 90 95

Ala Gly Gly Tyr Gly Ile Tyr Ser Pro Glu Glu Tyr Asn Gly Gly Leu  
100 105 110

Val Thr Val Ser Ser  
115

<210> 16

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Anti-Tac light chain amino acid sequence

<400> 16

Gln Ile Val Leu Thr Gln Ser Pro Ala Ile Met Ser Ala Ser Pro Gly  
1 5 10 15

Glu Lys Val Thr Ile Thr Cys Ser Ala Ser Ser Ser Ile Ser Tyr Met  
20 25 30

His Trp Phe Gln Gln Lys Pro Gly Thr Ser Pro Lys Leu Trp Ile Tyr  
35 40 45

Thr Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser  
50 55 60

Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Met Glu Ala Glu  
65 70 75 80

Asp Ala Ala Thr Tyr Tyr Cys His Gln Arg Ser Thr Tyr Pro Leu Thr  
85 90 95

Phe Gly Ser Gly Thr Lys Leu Glu Leu Lys  
100 105

<210> 17

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Eu light chain amino acid sequence

<400> 17

Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly  
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Ser Ile Asn Thr Trp  
20 25 30

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Met  
35 40 45

Tyr Lys Ala Ser Ser Leu Glu Ser Gly Val Pro Ser Arg Phe Ile Gly  
50 55 60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro  
65 70 75 80

Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Ser Asp Ser Lys  
85 90 95

Met Phe Gly Gln Gly Thr Lys Val Glu Val Lys  
100 105

<210> 18

<211> 433

<212> DNA

<213> Artificial Sequence

<220>

<223> Humanized anti-Tac heavy chain variable region

<220>

<221> CDS

<222> (6)..(410)

<223>

<400> 18

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Met Gly Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala	
1 5 10 15	

ggc gtg cac tct cag gtc cag ctt gtc cag tct ggg gct gaa gtc aag	98
Gly Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys	
20 25 30	

aaa cct ggc tcg agc gtg aag gtc tcc tgc aag gct tct ggc tac acc	146
Lys Pro Gly Ser Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr	
35 40 45	

ttt act agc tac agg atg cac tgg gta agg cag gcc cct gga cag ggt	194
Phe Thr Ser Tyr Arg Met His Trp Val Arg Gln Ala Pro Gly Gln Gly	
50 55 60	

ctg gaa tgg att gga tat att aat ccg tcg act ggg tat act gaa tac	242
Leu Glu Trp Ile Gly Tyr Ile Asn Pro Ser Thr Gly Tyr Thr Glu Tyr	
65 70 75	

aat cag aag ttc aag gac aag gca aca att act gca gac gaa tcc acc	290
Asn Gln Lys Phe Lys Asp Lys Ala Thr Ile Thr Ala Asp Glu Ser Thr	
80 85 90 95	

aat aca gcc tac atg gaa ctg agc agc ctg aga tct gag gac acc gca	338
Asn Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala	
100 105 110	

gtc tat tac tgt gca aga ggg ggg ggg gtc ttt gac tac tgg ggc caa	386
Val Tyr Tyr Cys Ala Arg Gly Gly Gly Val Phe Asp Tyr Trp Gly Gln	
115 120 125	

gga acc ctg gtc aca gtc tcc tca ggtgagtcct taaaacctct aga	433
Gly Thr Leu Val Thr Val Ser Ser	
130 135	

<210> 19

<211> 135

<212> PRT

<213> Artificial Sequence

<220>

<223> Humanized anti-Tac heavy chain variable region

<400> 19

Met Gly Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
1 5 10 15

Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
20 25 30

Pro Gly Ser Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
35 40 45

Thr Ser Tyr Arg Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu  
50 55 60

Glu Trp Ile Gly Tyr Ile Asn Pro Ser Thr Gly Tyr Thr Glu Tyr Asn  
65 70 75 80

Gln Lys Phe Lys Asp Lys Ala Thr Ile Thr Ala Asp Glu Ser Thr Asn  
85 90 95

Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val  
100 105 110

Tyr Tyr Cys Ala Arg Gly Gly Gly Val Phe Asp Tyr Trp Gly Gln Gly  
115 120 125

Thr Leu Val Thr Val Ser Ser  
130 135

<210> 20

<211> 403

<212> DNA

<213> Artificial Sequence

<220>

<223> Humanized anti-Tac light chain variable region

<220>

<221> CDS

<222> (6) .. (383)

<223>

<400> 20

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	1				5				10					15		

cca	gga	tca	acc	gga	gat	att	cag	atg	acc	cag	tct	cca	tct	acc	ctc	98
Pro	Gly	Ser	Thr	Gly	Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Thr	Leu	
				20				25						30		

tct	gct	agc	gtc	ggg	gat	agg	gtc	acc	ata	acc	tgc	tct	gcc	agc	tca	146
Ser	Ala	Ser	Val	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys	Ser	Ala	Ser	Ser	
			35				40						45			

agt	ata	agt	tac	atg	cac	tgg	tac	cag	cag	aag	cca	ggc	aaa	gct	ccc	194
Ser	Ile	Ser	Tyr	Met	His	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	
		50				55						60				

aag	ctt	cta	att	tat	acc	aca	tcc	aac	ctg	gct	tct	gga	gtc	cct	gct	242
Lys	Leu	Leu	Ile	Tyr	Thr	Thr	Ser	Asn	Leu	Ala	Ser	Gly	Val	Pro	Ala	
	65					70					75					

cgc	ttc	agt	ggc	agt	gga	tct	ggg	acc	gag	ttc	acc	ctc	aca	atc	agc	290
Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Glu	Phe	Thr	Leu	Thr	Ile	Ser	
80				85						90					95	

tct	ctg	cag	cca	gat	gat	ttc	gcc	act	tat	tac	tgc	cat	caa	agg	agt	338
Ser	Leu	Gln	Pro	Asp	Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	His	Gln	Arg	Ser	
				100				105						110		

act	tac	cca	ctc	acg	ttc	ggt	cag	ggg	acc	aag	gtg	gag	gtc	aaa		383
Thr	Tyr	Pro	Leu	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	Val	Lys		
			115				120						125			

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<210> 21

<211> 126

<212> PRT

<213> Artificial Sequence

<220>

<223> Humanized anti-Tac light chain variable region

<400> 21

Met	Glu	Thr	Asp	Thr	Leu	Leu	Leu	Trp	Val	Leu	Leu	Leu	Trp	Val	Pro
1				5				10					15		

Gly Ser Thr Gly Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser

20					25					30					
Ala	Ser	Val	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys	Ser	Ala	Ser	Ser	Ser
		35					40					45			
Ile	Ser	Tyr	Met	His	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys
	50					55					60				
Leu	Leu	Ile	Tyr	Thr	Thr	Ser	Asn	Leu	Ala	Ser	Gly	Val	Pro	Ala	Arg
65						70					75				80
Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Glu	Phe	Thr	Leu	Thr	Ile	Ser	Ser
				85					90					95	
Leu	Gln	Pro	Asp	Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	His	Gln	Arg	Ser	Thr
			100					105					110		
Tyr	Pro	Leu	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	Val	Lys		
		115					120					125			

<210> 22

<211> 126

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo HES12

<400> 22

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cactctcagg tccagcttgt ccagtctggg gctgaagtca agaaacctgg ctcgagcgtg 120

aaggtc 126

<210> 23

<211> 129

<212> DNA

<213> Artificial Sequence

<220>



<223> Oligo HES13

<400> 23

cccagtcgac ggattaatat atccaatcca ttccagaccc tgtccagggg cctgccttac 60

ccagtgcac ctgtagctag taaaggtgta gccagaagcc ttgcaggaga ccttcacgct 120

cgagccagg 129

<210> 24

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<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo HES14

<400> 24

tatattaatc cgtcgactgg gtatactgaa tacaatcaga agttcaagga caaggcaaca 60

attactgcag acgaatccac caatacagcc tacatggaac tgagcagcct gagatctgag 120

gaca 124

<210> 25

<211> 128

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo HES15

<400> 25

atatcgtcta gaggttttaa ggactcacct gaggagactg tgaccagggt tccttggccc 60

cagtagtcaa agaccccccc ccctcttgca cagtaataga ctgcggtgtc ctcagatctc 120

aggctgct 128

<210> 26

<211> 120

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo JFD1

<400> 26

caaatctaga tggagaccga taccctcctg ctatgggtcc tcctgctatg ggtcccagga 60

tcaaccggag atattcagat gaccagctct ccatctaccc tctctgctag cgtcggggat 120

<210> 27

<211> 114

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo JFD2

<400> 27

ataaattaga agcttgggag ctttgcttgg cttctgctgg taccagtgcg tgtaacttat 60

acttgagctg gcagagcagg ttatgggtgac cctatccccg acgctagcag agag 114

<210> 28

<211> 123

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo JFD3

<400> 28

gctcccaagc ttctaattta taccacatcc aacctgggctt ctggagtccc tgctcgcttc 60

agtggcagtg gatctgggac cgagttcacc ctcacaatca gctctctgca gccagatgat 120

ttc 123

<210> 29

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<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo JFD4

<400> 29

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ga 122

<210> 30

<211> 384

<212> DNA

<213> Artificial Sequence

<220>

<223> Light chain variable region of mik-betal

<220>

<221> CDS

<222> (1)..(384)

<223>

<400> 30

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Met Asp Phe Gln Val Gln Ile Phe Ser Phe Leu Leu Ile Ser Ala Ser  
1 5 10 15

gtc ata ctg tcc aga gga caa att gtt ctc acc cag tct cca gca atc 96  
Val Ile Leu Ser Arg Gly Gln Ile Val Leu Thr Gln Ser Pro Ala Ile  
20 25 30

atg tct gcg tct cca ggg gag aag gtc acc atg acc tgc agt ggc agc 144  
Met Ser Ala Ser Pro Gly Glu Lys Val Thr Met Thr Cys Ser Gly Ser  
35 40 45

tca agt gta agt ttc atg tac tgg tac cag cag agg cca gga tcc tcc 192  
Ser Ser Val Ser Phe Met Tyr Trp Tyr Gln Gln Arg Pro Gly Ser Ser  
50 55 60

ccc aga ctc ctg att tat gac aca tcc aac ctg gct tct gga gtc cct 240  
Pro Arg Leu Leu Ile Tyr Asp Thr Ser Asn Leu Ala Ser Gly Val Pro  
65 70 75 80

gtt	cgc	ttc	agt	ggc	agt	ggg	tct	ggg	acc	tct	tac	tct	ctc	aca	atc	288
Val	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Ser	Tyr	Ser	Leu	Thr	Ile	
			85						90					95		

agc	cga	atg	gag	gct	gaa	gat	gct	gcc	act	tat	tac	tgc	cag	cag	tgg	336
Ser	Arg	Met	Glu	Ala	Glu	Asp	Ala	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	Trp	
			100					105					110			

agt	act	tac	ccg	ctc	acg	ttc	ggg	gct	ggg	acc	aag	ctg	gag	ctg	aaa	384
Ser	Thr	Tyr	Pro	Leu	Thr	Phe	Gly	Ala	Gly	Thr	Lys	Leu	Glu	Leu	Lys	
		115					120					125				

<210> 31

<211> 128

<212> PRT

<213> Artificial Sequence

<220>

<223> Light chain variable region of mik-betal

<400> 31

Met	Asp	Phe	Gln	Val	Gln	Ile	Phe	Ser	Phe	Leu	Leu	Ile	Ser	Ala	Ser
1				5					10					15	

Val	Ile	Leu	Ser	Arg	Gly	Gln	Ile	Val	Leu	Thr	Gln	Ser	Pro	Ala	Ile
		20					25					30			

Met	Ser	Ala	Ser	Pro	Gly	Glu	Lys	Val	Thr	Met	Thr	Cys	Ser	Gly	Ser
		35				40						45			

Ser	Ser	Val	Ser	Phe	Met	Tyr	Trp	Tyr	Gln	Gln	Arg	Pro	Gly	Ser	Ser
	50					55					60				

Pro	Arg	Leu	Leu	Ile	Tyr	Asp	Thr	Ser	Asn	Leu	Ala	Ser	Gly	Val	Pro
65				70					75					80	

Val	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Ser	Tyr	Ser	Leu	Thr	Ile
			85					90					95		

Ser	Arg	Met	Glu	Ala	Glu	Asp	Ala	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	Trp
			100				105						110		

Ser	Thr	Tyr	Pro	Leu	Thr	Phe	Gly	Ala	Gly	Thr	Lys	Leu	Glu	Leu	Lys
		115					120					125			

<210> 32

<211> 414

<212> DNA

<213> Artificial Sequence

<220>

<223> Heavy chain variable region of mik-betal

<220>

<221> CDS

<222> (1)..(414)

<223>

<400> 32

atg gct gtc ttg ggg ctg ctc ttc tgc ctg gtg aca ttc cca agc tgt	48
Met Ala Val Leu Gly Leu Leu Phe Cys Leu Val Thr Phe Pro Ser Cys	
1 5 10 15	

gtc cta tcc cag gtg cag ctg aag cag tca gga cct ggc cta gtg cag	96
Val Leu Ser Gln Val Gln Leu Lys Gln Ser Gly Pro Gly Leu Val Gln	
20 25 30	

ccc tca cag agc ctg tcc atc acc tgc aca gtc tct ggt ttc tca gta	144
Pro Ser Gln Ser Leu Ser Ile Thr Cys Thr Val Ser Gly Phe Ser Val	
35 40 45	

aca agt tat ggt gta cac tgg att cgc cag tct cca gga aag ggt ctg	192
Thr Ser Tyr Gly Val His Trp Ile Arg Gln Ser Pro Gly Lys Gly Leu	
50 55 60	

gag tgg ctg gga gtg ata tgg agt ggt gga agc aca gac tat aat gca	240
Glu Trp Leu Gly Val Ile Trp Ser Gly Gly Ser Thr Asp Tyr Asn Ala	
65 70 75 80	

gct ttc ata tcc aga ctg acc atc agc aag gac aac tcc aag agc caa	288
Ala Phe Ile Ser Arg Leu Thr Ile Ser Lys Asp Asn Ser Lys Ser Gln	
85 90 95	

gtt ttc ttt aaa gtg aac agt ctg caa cct gct gac aca gcc ata tac	336
Val Phe Phe Lys Val Asn Ser Leu Gln Pro Ala Asp Thr Ala Ile Tyr	
100 105 110	

tat tgt gcc aga gct ggg gac tat aat tac gac ggt ttt gct tac tgg	384
Tyr Cys Ala Arg Ala Gly Asp Tyr Asn Tyr Asp Gly Phe Ala Tyr Trp	
115 120 125	

ggc caa ggg act ctg gtc act gtc tct gcg	414
Gly Gln Gly Thr Leu Val Thr Val Ser Ala	
130 135	

<210> 33

<211> 138

<212> PRT

<213> Artificial Sequence

<220>

<223> Heavy chain variable region of mik-betal

<400> 33

Met Ala Val Leu Gly Leu Leu Phe Cys Leu Val Thr Phe Pro Ser Cys  
1 5 10 15

Val Leu Ser Gln Val Gln Leu Lys Gln Ser Gly Pro Gly Leu Val Gln  
20 25 30

Pro Ser Gln Ser Leu Ser Ile Thr Cys Thr Val Ser Gly Phe Ser Val  
35 40 45

Thr Ser Tyr Gly Val His Trp Ile Arg Gln Ser Pro Gly Lys Gly Leu  
50 55 60

Glu Trp Leu Gly Val Ile Trp Ser Gly Gly Ser Thr Asp Tyr Asn Ala  
65 70 75 80

Ala Phe Ile Ser Arg Leu Thr Ile Ser Lys Asp Asn Ser Lys Ser Gln  
85 90 95

Val Phe Phe Lys Val Asn Ser Leu Gln Pro Ala Asp Thr Ala Ile Tyr  
100 105 110

Tyr Cys Ala Arg Ala Gly Asp Tyr Asn Tyr Asp Gly Phe Ala Tyr Trp  
115 120 125

Gly Gln Gly Thr Leu Val Thr Val Ser Ala  
130 135

<210> 34

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of light chain for human Lay Ab

<400> 34

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Val Ser Val Gly  
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Ser Gln Asn Val Asn Ala Tyr  
20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Leu Ala Pro Lys Leu Leu Ile  
35 40 45

Tyr Gly Ala Ser Thr Arg Glu Ala Gly Val Pro Ser Arg Phe Ser Gly  
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Phe Thr Ile Ser Ser Leu Gln Pro  
65 70 75 80

Glu Asp Ile Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Asn Trp Pro Pro  
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys  
100 105

<210> 35

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of light chain for humanized mik-betal Ab

<400> 35

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly  
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Ser Gly Ser Ser Ser Val Ser Phe Met  
20 25 30

Tyr Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr





Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
115 120

<210> 37

<211> 119

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of heavy chain for humanized mik-betal Ab

<400> 37

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Val Thr Ser Tyr  
20 25 30

Gly Val His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

Gly Val Ile Trp Ser Gly Gly Ser Thr Asp Tyr Asn Ala Ala Phe Ile  
50 55 60

Ser Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu  
65 70 75 80

Gln Met Asn Ser Leu Gln Ala Glu Asp Thr Ala Ile Tyr Tyr Cys Ala  
85 90 95

Arg Ala Gly Asp Tyr Asn Tyr Asp Gly Phe Ala Tyr Trp Gly Gln Gly  
100 105 110

Thr Leu Val Thr Val Ser Ser  
115

<210> 38

<211> 107

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo vc13

<400> 38

ttctgctggt accagtacat gaaacttaca cttgagctgc cactgcaggt gatggtgacg 60

cggtcaccca ctgaggcact gaggctagat ggagactggg tcatttg 107

<210> 39

<211> 136

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo vc14

<400> 39

catgtactgg taccagcaga agccaggaaa agctccgaaa cttctgattt atgacacatc 60

caacctggct tctggagtcc cttcccgtt cagtggcagt gggctctggga ccgattacac 120

ctttacaatc tcttca 136

<210> 40

<211> 137

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo vc15

<400> 40

tgtgtctaga aaagtgtact tacgttttac ctcgaccttg gtcccttgac cgaacgtgag 60

cgggtaagta ctccactgct ggcagtaata agtggctata tcttccggct gaagtgaaga 120

gattgtaaag gtgtaat 137

<210> 41

<211> 108

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo vc16

<400> 41

cacatctaga ccaccatgga ttttcaagtg cagatcttca gcttcctgct aatcagtgcc 60

tcagtcatac tgtccagagg agatattcaa atgacccagt ctccatct 108

<210> 42

<211> 138

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo vc11

<400> 42

tagtctgtcg acccaccact ccatactact cccaccact cgagtcctt tccaggagcc 60

tggcggaccc agtgtacacc ataacttggt acggtgaaac cactggcggc acaagacagt 120

ctcagagatc ctcttggc 138

<210> 43

<211> 126

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo vc12

<400> 43

tggtgggtcg acagactata atgcagcttt catatccaga ttaccatca gcagagacaa 60

cagcaagaac aactgtatc tccaaatgaa tagcctgcaa gccgaggaca cagccatata 120

ttattg 126

<210> 44

<211> 130

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo wps54

<400> 44

acactctaga ccaccatggc tgtcttgggg ctgctcttct gcctgggtgac attcccaagc 60

tgtgtcctat ccgctgtcca gctgctagag agtgggtggcg gtctgggtgca gccaggagga 120

tctctgagac 130

<210> 45

<211> 118

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo wps57

<400> 45

acactctaga agttaggact cacctgaaga gacagtgacc agagtcctt ggccccagta 60

agcaaaaccg tcgtaattat agtccccagc tctggcacia taatatatgg ctgtgtcc 118

<210> 46

<211> 111

<212> PRT

<213> Mus sp.

<400> 46

Asp Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly  
1 5 10 15

Gln Arg Ala Thr Ile Ser Cys Arg Ala Ser Gln Ser Val Ser Thr Ser  
20 25 30

Thr Tyr Asn Tyr Met His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro  
35 40 45

Lys Leu Leu Ile Lys Tyr Ala Ser Asn Leu Glu Ser Gly Val Pro Ala  
50 55 60

Arg Phe Ser Gly Ser Gly Phe Gly Thr Asp Phe Thr Leu Asn Ile His  
65 70 75 80

Pro Val Glu Glu Glu Asp Thr Val Thr Tyr Tyr Cys Gln His Ser Trp  
85 90 95

Glu Ile Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys  
100 105 110

<210> 47

<211> 111

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of light chain of humanized Fd79 antibody

<400> 47

Glu Ile Val Met Thr Gln Ser Pro Ala Thr Leu Ser Val Ser Pro Gly  
1 5 10 15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Thr Ser  
20 25 30

Thr Tyr Asn Tyr Met His Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro  
35 40 45

Arg Leu Leu Ile Lys Tyr Ala Ser Asn Leu Glu Ser Gly Ile Pro Ala  
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser  
65 70 75 80

Arg Leu Glu Ser Glu Asp Phe Ala Val Tyr Tyr Cys Gln His Ser Trp  
85 90 95

Glu Ile Pro Tyr Thr Phe Gly Gln Gly Thr Arg Val Glu Ile Lys

	100	105	110
<210>	48		
<211>	122		
<212>	PRT		
<213>	Mus sp.		
<400>	48		
	Glu Met Ile Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Ala		
	1                    5                    10                    15		
	Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr		
	20                    25                    30		
	Gly Leu Ser Trp Val Arg Gln Thr Ser Asp Arg Arg Leu Glu Trp Val		
	35                    40                    45		
	Ala Ser Ile Ser Arg Gly Gly Gly Arg Ile Tyr Ser Pro Asp Asn Leu		
	50                    55                    60		
	Lys Gly Arg Phe Thr Ile Ser Arg Glu Asp Ala Lys Asn Thr Leu Tyr		
	65                    70                    75                    80		
	Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Leu Tyr Tyr Cys		
	85                    90                    95		
	Leu Arg Glu Gly Ile Tyr Tyr Ala Asp Tyr Gly Phe Phe Asp Val Trp		
	100                    105                    110		
	Gly Thr Gly Thr Thr Val Ile Val Ser Ser		
	115                    120		
<210>	49		
<211>	122		
<212>	PRT		
<213>	Artificial Sequence		
<220>			
<223>	Amino acid sequence of heavy chain of humanized Fd79 antibody		

<400> 49

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asn Tyr  
20 25 30

Gly Leu Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

Ala Ser Ile Ser Arg Gly Gly Gly Arg Ile Tyr Ser Pro Asp Asn Leu  
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asn Asp Ser Lys Asn Thr Leu Tyr  
65 70 75 80

Leu Gln Met Asn Ser Leu Gln Ala Glu Asp Thr Ala Leu Tyr Tyr Cys  
85 90 95

Leu Arg Glu Gly Ile Tyr Tyr Ala Asp Tyr Gly Phe Phe Asp Val Trp  
100 105 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
115 120

<210> 50

<211> 107

<212> PRT

<213> Mus sp.

<400> 50

Asp Ile Val Met Thr Gln Ser His Lys Phe Met Ser Thr Ser Val Gly  
1 5 10 15

Asp Arg Val Ser Ile Thr Cys Lys Ala Ser Gln Asp Val Gly Ser Ala  
20 25 30

Val Val Trp His Gln Gln Lys Ser Gly Gln Ser Pro Lys Leu Leu Ile  
35 40 45

Tyr Trp Ala Ser Thr Arg His Thr Gly Val Pro Asp Arg Phe Thr Gly  
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Thr Asn Val Gln Ser  
65 70 75 80

Glu Asp Leu Ala Asp Tyr Phe Cys Gln Gln Tyr Ser Ile Phe Pro Leu  
85 90 95

Thr Phe Gly Ala Gly Thr Arg Leu Glu Leu Lys  
100 105

<210> 51

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of light chain of humanized Fd138-80 antibody

<400> 51

Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly  
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln Asp Val Gly Ser Ala  
20 25 30

Val Val Trp His Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile  
35 40 45

Tyr Trp Ala Ser Thr Arg His Thr Gly Val Pro Ser Arg Phe Thr Gly  
50 55 60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro  
65 70 75 80

Asp Asp Phe Ala Thr Tyr Phe Cys Gln Gln Tyr Ser Ile Phe Pro Leu  
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys  
100 105

<210> 52

<211> 121



<212> PRT

<213> Mus sp.

<400> 52

Gln Val Gln Leu Gln Gln Ser Asp Ala Glu Leu Val Lys Pro Gly Ala  
1 5 10 15

Ser Val Lys Ile Ser Cys Lys Val Ser Gly Tyr Thr Phe Thr Asp His  
20 25 30

Thr Ile His Trp Met Lys Gln Arg Pro Glu Gln Gly Leu Glu Trp Phe  
35 40 45

Gly Tyr Ile Tyr Pro Arg Asp Gly His Thr Arg Tyr Ser Glu Lys Phe  
50 55 60

Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ala Ser Thr Ala Tyr  
65 70 75 80

Met His Leu Asn Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys  
85 90 95

Ala Arg Gly Arg Asp Ser Arg Glu Arg Asn Gly Phe Ala Tyr Trp Gly  
100 105 110

Gln Gly Thr Leu Val Thr Val Ser Ala  
115 120

<210> 53

<211> 121

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of heavy chain of humanized Fd138-80 antibody

<400> 53

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp His

	20		25		30										
Thr	Ile	His	Trp	Met	Arg	Gln	Ala	Pro	Gly	Gln	Gly	Leu	Glu	Trp	Phe
	35					40						45			
Gly	Tyr	Ile	Tyr	Pro	Arg	Asp	Gly	His	Thr	Arg	Tyr	Ser	Glu	Lys	Phe
	50					55					60				
Lys	Gly	Lys	Ala	Thr	Ile	Thr	Ala	Asp	Glu	Ser	Thr	Asn	Thr	Ala	Tyr
65					70					75					80
Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Val	Tyr	Phe	Cys
				85					90					95	
Ala	Arg	Gly	Arg	Asp	Ser	Arg	Glu	Arg	Asn	Gly	Phe	Ala	Tyr	Trp	Gly
			100					105					110		
Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser							
		115					120								

<210> 54

<211> 111

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 54

Asp	Ile	Val	Leu	Thr	Gln	Ser	Pro	Ala	Ser	Leu	Ala	Val	Ser	Leu	Gly
1				5					10					15	
Gln	Arg	Ala	Thr	Ile	Ser	Cys	Arg	Ala	Ser	Glu	Ser	Val	Asp	Asn	Tyr
			20					25					30		
Gly	Ile	Ser	Phe	Met	Asn	Trp	Phe	Gln	Gln	Lys	Pro	Gly	Gln	Pro	Pro
		35					40					45			
Lys	Leu	Leu	Ile	Tyr	Ala	Ala	Ser	Asn	Gln	Gly	Ser	Gly	Val	Pro	Ala
	50					55					60				
Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Ser	Leu	Asn	Ile	His
65					70					75					80

Pro Met Glu Glu Asp Asp Thr Ala Met Tyr Phe Cys Gln Gln Ser Lys  
85 90 95

Glu Val Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys  
100 105 110

<210> 55

<211> 111

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 55

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly  
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Glu Ser Val Asp Asn Tyr  
20 25 30

Gly Ile Ser Phe Met Asn Trp Phe Gln Gln Lys Pro Gly Lys Ala Pro  
35 40 45

Lys Leu Leu Ile Tyr Ala Ala Ser Asn Gln Gly Ser Gly Val Pro Ser  
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Asn Ile Ser  
65 70 75 80

Ser Leu Gln Pro Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Lys  
85 90 95

Glu Val Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys  
100 105 110

<210> 56

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 56

Glu Val Gln Leu Gln Gln Ser Gly Pro Glu Leu Val Lys Pro Gly Ala  
1 5 10 15

Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp Tyr  
20 25 30

Asn Met His Trp Val Lys Gln Ser His Gly Lys Ser Leu Glu Trp Ile  
35 40 45

Gly Tyr Ile Tyr Pro Tyr Asn Gly Gly Thr Gly Tyr Asn Gln Lys Phe  
50 55 60

Lys Ser Lys Ala Thr Leu Thr Val Asp Asn Ser Ser Ser Thr Ala Tyr  
65 70 75 80

Met Asp Val Arg Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Gly Arg Pro Ala Met Asp Tyr Trp Gly Gln Gly Thr Ser Val  
100 105 110

Thr Val Ser Ser  
115

<210> 57

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 57

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp Tyr  
20 25 30

Asn Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Ile  
35 40 45

Gly Tyr Ile Tyr Pro Tyr Asn Gly Gly Thr Gly Tyr Asn Gln Lys Phe  
50 55 60

Lys Ser Lys Ala Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Gly Arg Pro Ala Met Asp Tyr Trp Gly Gln Gly Thr Leu Val  
100 105 110

Thr Val Ser Ser  
115

<210> 58

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 58

Gln Ile Val Leu Thr Gln Ser Pro Ala Ile Met Ser Ala Ser Pro Gly  
1 5 10 15

Glu Lys Val Thr Met Thr Cys Ser Gly Ser Ser Ser Val Ser Phe Met  
20 25 30

Tyr Trp Tyr Gln Gln Arg Pro Gly Ser Ser Pro Arg Leu Leu Ile Tyr  
35 40 45

Asp Thr Ser Asn Leu Ala Ser Gly Val Pro Val Arg Phe Ser Gly Ser  
50 55 60

Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Met Glu Ala Glu

65		70		75		80									
Asp	Ala	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	Trp	Ser	Thr	Tyr	Pro	Leu	Thr
				85					90					95	

Phe	Gly	Ala	Gly	Thr	Lys	Leu	Glu	Leu	Lys
			100					105	

<210> 59

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 59

Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Leu	Ser	Ala	Ser	Val	Gly
1				5				10						15	

Asp	Arg	Val	Thr	Ile	Thr	Cys	Ser	Gly	Ser	Ser	Ser	Val	Ser	Phe	Met
			20					25					30		

Tyr	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	Leu	Leu	Ile	Tyr
		35					40					45			

Asp	Thr	Ser	Asn	Leu	Ala	Ser	Gly	Val	Pro	Ser	Arg	Phe	Ser	Gly	Ser
	50					55					60				

Gly	Ser	Gly	Thr	Asp	Tyr	Thr	Phe	Thr	Ile	Ser	Ser	Leu	Gln	Pro	Glu
65					70					75					80

Asp	Ile	Ala	Thr	Tyr	Tyr	Cys	Gln	Gln	Trp	Ser	Thr	Tyr	Pro	Leu	Thr
				85					90					95	

Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	Val	Lys
			100					105	

<210> 60

<211> 119

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 60

Gln Val Gln Leu Lys Gln Ser Gly Pro Gly Leu Val Gln Pro Ser Gln  
1 5 10 15

Ser Leu Ser Ile Thr Cys Thr Val Ser Gly Phe Ser Val Thr Ser Tyr  
20 25 30

Gly Val His Trp Ile Arg Gln Ser Pro Gly Lys Gly Leu Glu Trp Leu  
35 40 45

Gly Val Ile Trp Ser Gly Gly Ser Thr Asp Tyr Asn Ala Ala Phe Ile  
50 55 60

Ser Arg Leu Thr Ile Ser Lys Asp Asn Ser Lys Ser Gln Val Phe Phe  
65 70 75 80

Lys Val Asn Ser Leu Gln Pro Ala Asp Thr Ala Ile Tyr Tyr Cys Ala  
85 90 95

Arg Ala Gly Asp Tyr Asn Tyr Asp Gly Phe Ala Tyr Trp Gly Gln Gly  
100 105 110

Thr Leu Val Thr Val Ser Ala  
115

<210> 61

<211> 119

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 61

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gln  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Val Thr Ser Tyr  
20 25 30

Gly Val His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

Gly Val Ile Trp Ser Gly Gly Ser Thr Asp Tyr Asn Ala Ala Phe Ile  
50 55 60

Ser Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu  
65 70 75 80

Gln Met Asn Ser Leu Gln Ala Glu Asp Thr Ala Ile Tyr Tyr Cys Ala  
85 90 95

Arg Ala Gly Asp Tyr Asn Tyr Asp Gly Phe Ala Tyr Trp Gly Gln Gly  
100 105 110

Thr Leu Val Thr Val Ser Ser  
115

<210> 62

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 62

Asp Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Val Thr Pro Gly  
1 5 10 15

Asp Ser Val Ser Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn  
20 25 30

Leu His Trp Tyr Gln Gln Lys Ser His Glu Ser Pro Arg Leu Leu Ile  
35 40 45

Lys Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Ser Arg Phe Ser Gly  
50 55 60



Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Val Asn Gly Val Glu Thr  
65 70 75 80

Glu Asp Phe Gly Met Tyr Phe Cys Gln Gln Ser Asn Ser Trp Pro His  
85 90 95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys  
100 105

<210> 63

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 63

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly  
1 5 10 15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn  
20 25 30

Leu His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile  
35 40 45

Lys Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Asp Arg Phe Ser Gly  
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Arg Leu Glu Pro  
65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Ser Asn Ser Trp Pro His  
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys  
100 105

<210> 64

<211> 119

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 64

Glu Val Gln Leu Gln Gln Ser Gly Pro Glu Leu Val Lys Pro Gly Ala  
1 5 10 15

Ser Met Lys Ile Ser Cys Lys Ala Ser Val Tyr Ser Phe Thr Gly Tyr  
20 25 30

Thr Met Asn Trp Val Lys Gln Ser His Gly Gln Asn Leu Glu Trp Ile  
35 40 45

Gly Leu Ile Asn Pro Tyr Asn Gly Gly Thr Ser Tyr Asn Gln Lys Phe  
50 55 60

Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Asn Thr Ala Tyr  
65 70 75 80

Met Glu Leu Leu Ser Leu Thr Ser Ala Asp Ser Ala Val Tyr Tyr Cys  
85 90 95

Thr Arg Arg Gly Phe Arg Asp Tyr Ser Met Asp Tyr Trp Gly Gln Gly  
100 105 110

Thr Ser Val Thr Val Ser Ser  
115

<210> 65

<211> 119

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 65

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Gly Tyr  
20 25 30

Thr Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

Gly Leu Ile Asn Pro Tyr Asn Gly Gly Thr Ser Tyr Asn Gln Lys Phe  
50 55 60

Lys Gly Arg Val Thr Val Ser Leu Lys Pro Ser Phe Asn Gln Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Phe Ser Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Thr Arg Arg Gly Phe Arg Asp Tyr Ser Met Asp Tyr Trp Gly Gln Gly  
100 105 110

Thr Leu Val Thr Val Ser Ser  
115

<210> 66

<211> 393

<212> DNA

<213> Artificial Sequence

<220>

<223> Light chain of M195 Ab

<220>

<221> CDS

<222> (1)..(393)

<223>

<400> 66

atg gag aaa gac aca ctc ctg cta tgg gtc ctg ctt ctc tgg gtt cca 48  
Met Glu Lys Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

ggt tcc aca ggt gac att gtg ctg acc caa tct cca gct tct ttg gct 96  
Gly Ser Thr Gly Asp Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala

20					25					30						
gtg	tct	cta	ggg	cag	agg	gcc	acc	atc	tcc	tgc	aga	gcc	agc	gaa	agt	144
Val	Ser	Leu	Gly	Gln	Arg	Ala	Thr	Ile	Ser	Cys	Arg	Ala	Ser	Glu	Ser	
		35					40					45				
ggt	gat	aat	tat	ggc	att	agt	ttt	atg	aac	tgg	ttc	caa	cag	aaa	cca	192
Val	Asp	Asn	Tyr	Gly	Ile	Ser	Phe	Met	Asn	Trp	Phe	Gln	Gln	Lys	Pro	
	50					55				60						
gga	cag	cca	ccc	aaa	ctc	ctc	atc	tat	gct	gca	tcc	aac	caa	gga	tcc	240
Gly	Gln	Pro	Pro	Lys	Leu	Leu	Ile	Tyr	Ala	Ala	Ser	Asn	Gln	Gly	Ser	
65				70					75					80		
ggg	gtc	cct	gcc	agg	ttt	agt	ggc	agt	ggg	tct	ggg	aca	gac	ttc	agc	288
Gly	Val	Pro	Ala	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Ser	
				85				90					95			
ctc	aac	atc	cat	cct	atg	gag	gag	gat	gat	act	gca	atg	tat	ttc	tgt	336
Leu	Asn	Ile	His	Pro	Met	Glu	Glu	Asp	Asp	Thr	Ala	Met	Tyr	Phe	Cys	
			100					105					110			
cag	caa	agt	aag	gag	gtt	ccg	tgg	acg	ttc	ggg	gga	ggc	acc	aag	ctg	384
Gln	Gln	Ser	Lys	Glu	Val	Pro	Trp	Thr	Phe	Gly	Gly	Gly	Thr	Lys	Leu	
		115					120					125				
gaa	atc	aaa														393
Glu	Ile	Lys														
		130														

<210> 67

<211> 131

<212> PRT

<213> Artificial Sequence

<220>

<223> Light chain of M195 Ab

<400> 67

Met	Glu	Lys	Asp	Thr	Leu	Leu	Leu	Trp	Val	Leu	Leu	Leu	Trp	Val	Pro
1				5					10					15	

Gly	Ser	Thr	Gly	Asp	Ile	Val	Leu	Thr	Gln	Ser	Pro	Ala	Ser	Leu	Ala
			20					25					30		

Val	Ser	Leu	Gly	Gln	Arg	Ala	Thr	Ile	Ser	Cys	Arg	Ala	Ser	Glu	Ser
		35					40					45			

Val	Asp	Asn	Tyr	Gly	Ile	Ser	Phe	Met	Asn	Trp	Phe	Gln	Gln	Lys	Pro
	50					55					60				

Gly Gln Pro Pro Lys Leu Leu Ile Tyr Ala Ala Ser Asn Gln Gly Ser  
65 70 75 80

Gly Val Pro Ala Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Ser  
85 90 95

Leu Asn Ile His Pro Met Glu Glu Asp Asp Thr Ala Met Tyr Phe Cys  
100 105 110

Gln Gln Ser Lys Glu Val Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu  
115 120 125

Glu Ile Lys  
130

<210> 68

<211> 405

<212> DNA

<213> Artificial Sequence

<220>

<223> Light chain of M195 Ab

<220>

<221> CDS

<222> (1)..(405)

<223>

<400> 68

atg gga tgg agc tgg atc ttt ctc ttc ctc ctg tca gga act gca ggc 48  
Met Gly Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
1 5 10 15

gtc cac tct gag gtc cag ctt cag cag tca gga cct gag ctg gtg aaa 96  
Val His Ser Glu Val Gln Leu Gln Gln Ser Gly Pro Glu Leu Val Lys  
20 25 30

cct ggg gcc tca gtg aag ata tcc tgc aag gct tct gga tac aca ttc 144  
Pro Gly Ala Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
35 40 45

act gac tac aac atg cac tgg gtg aag cag agc cat gga aag agc ctt 192  
Thr Asp Tyr Asn Met His Trp Val Lys Gln Ser His Gly Lys Ser Leu

50	55	60	
gag tgg att gga tat att tat cct tac aat ggt ggt act ggc tac aac			240
Glu Trp Ile Gly Tyr Ile Tyr Pro Tyr Asn Gly Gly Thr Gly Tyr Asn			
65	70	75	80
cag aag ttc aag agc aag gcc aca ttg act gta gac aat tcc tcc agc			288
Gln Lys Phe Lys Ser Lys Ala Thr Leu Thr Val Asp Asn Ser Ser Ser			
	85	90	95
aca gcc tac atg gac gtc cgc agc ctg aca tct gag gac tct gca gtc			336
Thr Ala Tyr Met Asp Val Arg Ser Leu Thr Ser Glu Asp Ser Ala Val			
	100	105	110
tat tac tgt gca aga ggg cgc ccc gct atg gac tac tgg ggt caa gga			384
Tyr Tyr Cys Ala Arg Gly Arg Pro Ala Met Asp Tyr Trp Gly Gln Gly			
	115	120	125
acc tca gtc acc gtc tcc tca			405
Thr Ser Val Thr Val Ser Ser			
130	135		

<210> 69

<211> 135

<212> PRT

<213> Artificial Sequence

<220>

<223> Light chain of M195 Ab

<400> 69

Met Gly Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly
1 5 10 15

Val His Ser Glu Val Gln Leu Gln Gln Ser Gly Pro Glu Leu Val Lys
20 25 30

Pro Gly Ala Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe
35 40 45

Thr Asp Tyr Asn Met His Trp Val Lys Gln Ser His Gly Lys Ser Leu
50 55 60

Glu Trp Ile Gly Tyr Ile Tyr Pro Tyr Asn Gly Gly Thr Gly Tyr Asn
65 70 75 80

Gln Lys Phe Lys Ser Lys Ala Thr Leu Thr Val Asp Asn Ser Ser Ser
85 90 95

Thr Ala Tyr Met Asp Val Arg Ser Leu Thr Ser Glu Asp Ser Ala Val  
100 105 110

Tyr Tyr Cys Ala Arg Gly Arg Pro Ala Met Asp Tyr Trp Gly Gln Gly  
115 120 125

Thr Ser Val Thr Val Ser Ser  
130 135

<210> 70

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of light chain of M195 Ab

<400> 70

Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly  
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Ser Ile Asn Thr Trp  
20 25 30

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Met  
35 40 45

Tyr Lys Ala Ser Ser Leu Glu Ser Gly Val Pro Ser Arg Phe Ile Gly  
50 55 60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro  
65 70 75 80

Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Ser Asp Ser Lys  
85 90 95

Met Phe Gly Gln Gly Thr Lys Val Glu Val Lys  
100 105

<210> 71

<211> 111

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of light chain of Eu Ab

<400> 71

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly  
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Glu Ser Val Asp Asn Tyr  
20 25 30

Gly Ile Ser Phe Met Asn Trp Phe Gln Gln Lys Pro Gly Lys Ala Pro  
35 40 45

Lys Leu Leu Ile Tyr Ala Ala Ser Asn Gln Gly Ser Gly Val Pro Ser  
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser  
65 70 75 80

Ser Leu Gln Pro Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Ser Lys  
85 90 95

Glu Val Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys  
100 105 110

<210> 72

<211> 117

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of heavy chain of M195 Ab

<400> 72

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15



Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Arg Ser  
20 25 30

Ala Ile Ile Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
35 40 45

Gly Gly Ile Val Pro Met Phe Gly Pro Pro Asn Tyr Ala Gln Lys Phe  
50 55 60

Gln Gly Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Phe Tyr Phe Cys  
85 90 95

Ala Gly Gly Tyr Gly Ile Tyr Ser Pro Glu Glu Tyr Asn Gly Gly Leu  
100 105 110

Val Thr Val Ser Ser  
115

<210> 73

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of heavy chain of Eu Ab

<400> 73

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp Tyr  
20 25 30

Asn Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Ile  
35 40 45

Gly Tyr Ile Tyr Pro Tyr Asn Gly Gly Thr Gly Tyr Asn Gln Lys Phe  
50 55 60

Lys Ser Lys Ala Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr

65		70		75		80									
Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
				85					90					95	
Ala	Arg	Gly	Arg	Pro	Ala	Met	Asp	Tyr	Trp	Gly	Gln	Gly	Thr	Leu	Val
			100					105					110		
Thr	Val	Ser	Ser												
			115												

<210> 74

<211> 132

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo used to construct M195 H chain

<400> 74

tatatctaga ccaccatggg atggagctgg atctttctct tcctcctgtc aggaactgct	60
ggcgtccact ctcagggttca gctgggtgcag tctggagctg aggtgaagaa gcctgggagc	120
tcagtgaagg tt	132

<210> 75

<211> 133

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo used to construct M195 H chain

<400> 75

agccggtacc accattgtaa ggataaatat atccaatcca ttccaggcct tggccaggag	60
cctgcctcac ccagtgcattg ttgtagtcag tgaagggtgta gccagaagct ttgcaggaaa	120
ccttcactga gct	133

<210> 76

<211> 112

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo used to construct M195 H chain

<400> 76

tggtggtacc ggctacaacc agaagttcaa gagcaaggcc acaattacag cagacgagag 60

tactaacaca gcctacatgg aactctccag cctgaggtct gaggacactg ca 112

<210> 77

<211> 111

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo used to construct M195 H chain

<400> 77

tatatctaga ggccattctt acctgaagag acagtgacca gagtccttg gccccagtag 60

tccatagcgg ggcgccctct tgcgcagtaa tagactgcag tgcctcaga c 111

<210> 78

<211> 122

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo used to construct M195 L chain

<400> 78

tatatctaga ccacatgga gaaagacaca ctctgctat gggtcctgct tctctgggtt 60

ccagggtcca cagggtgacat tcagatgacc cagtctccga gctctctgtc cgcacagta 120

gg 122

<210> 79

<211> 122

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo used to construct M195 L chain

<400> 79

tcagaagctt aggagccttc ccgggtttct gttggaacca gttcataaag ctaatgccat 60

aattgtcgac actttcgctg gctctgcatg tgatgggtgac cctgtctcct actgatgcgg 120

ac 122

<210> 80

<211> 119

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo used to construct M195 L chain

<400> 80

tcctaagctt ctgatttacg ctgcatccaa ccaaggctcc ggggtaccct ctgcgtttctc 60

aggcagtgga tctgggacag acttcactct caccatttca tctctgcagc ctgatgact 119

<210> 81

<211> 118

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo used to construct M195 L chain

<400> 81

tatatctaga ctttggattc tacttacgtt tgatctccac cttgggtccct tgaccgaacg 60

tccacggaac ctcttactt tgctgacagt aataggttgc gaagtcacatca ggctgcag 118

<210> 82

<211> 381

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence of CMV5 light chain

<220>

<221> CDS

<222> (1)..(381)

<223>

<400> 82

atg	gtt	ttc	aca	cct	cag	ata	ctt	gga	ctt	atg	ctt	ttt	tgg	att	tca	48
Met	Val	Phe	Thr	Pro	Gln	Ile	Leu	Gly	Leu	Met	Leu	Phe	Trp	Ile	Ser	
1				5				10					15			

gcc	tcc	aga	ggt	gat	att	gtg	cta	act	cag	tct	cca	gcc	acc	ctg	tct	96
Ala	Ser	Arg	Gly	Asp	Ile	Val	Leu	Thr	Gln	Ser	Pro	Ala	Thr	Leu	Ser	
			20					25					30			

gtg	act	ccg	gga	gat	agc	gtc	agt	ctt	tcc	tgc	agg	gcc	agc	caa	agt	144
Val	Thr	Pro	Gly	Asp	Ser	Val	Ser	Leu	Ser	Cys	Arg	Ala	Ser	Gln	Ser	
		35					40					45				

att	agc	aac	aac	cta	cac	tgg	tat	caa	caa	aaa	tca	cat	gag	tct	cca	192
Ile	Ser	Asn	Asn	Leu	His	Trp	Tyr	Gln	Gln	Lys	Ser	His	Glu	Ser	Pro	
	50					55				60						

agg	ctt	ctc	atc	aag	tat	gct	tcc	cag	tcc	atc	tct	ggg	atc	ccc	tcc	240
Arg	Leu	Leu	Ile	Lys	Tyr	Ala	Ser	Gln	Ser	Ile	Ser	Gly	Ile	Pro	Ser	
65					70					75					80	

agg	ttc	agt	ggc	agt	gga	tca	ggg	aca	gat	ttc	act	ctc	agt	gtc	aac	288
Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Ser	Val	Asn	
				85					90					95		

ggt	gtg	gag	act	gaa	gat	ttt	gga	atg	tat	ttc	tgt	caa	cag	agt	aac	336
Gly	Val	Glu	Thr	Glu	Asp	Phe	Gly	Met	Tyr	Phe	Cys	Gln	Gln	Ser	Asn	
			100					105					110			

agt	tgg	cct	cat	acg	ttc	gga	ggg	ggg	acc	aag	ctg	gaa	ata	aaa		381
Ser	Trp	Pro	His	Thr	Phe	Gly	Gly	Gly	Thr	Lys	Leu	Glu	Ile	Lys		
		115					120					125				

<210> 83

<211> 127

<212> PRT

<213> Artificial Sequence

<220>

<223> Sequence of CMV5 light chain

<400> 83

Met Val Phe Thr Pro Gln Ile Leu Gly Leu Met Leu Phe Trp Ile Ser  
1 5 10 15

Ala Ser Arg Gly Asp Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser  
20 25 30

Val Thr Pro Gly Asp Ser Val Ser Leu Ser Cys Arg Ala Ser Gln Ser  
35 40 45

Ile Ser Asn Asn Leu His Trp Tyr Gln Gln Lys Ser His Glu Ser Pro  
50 55 60

Arg Leu Leu Ile Lys Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Ser  
65 70 75 80

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Val Asn  
85 90 95

Gly Val Glu Thr Glu Asp Phe Gly Met Tyr Phe Cys Gln Gln Ser Asn  
100 105 110

Ser Trp Pro His Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys  
115 120 125

<210> 84

<211> 414

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence of CMV light chain variable region

<220>

<221> CDS

<222> (1)..(414)

<223>

<400> 84

atg	gga	tgg	agc	tgg	atc	ttt	ctc	ttc	ctc	ctg	tca	gga	act	gca	ggt	48
Met	Gly	Trp	Ser	Trp	Ile	Phe	Leu	Phe	Leu	Leu	Ser	Gly	Thr	Ala	Gly	
1				5					10					15		

gtc	cac	tct	gag	gtc	cag	ctg	caa	cag	tct	gga	cct	gag	ctg	gtg	aag	96
Val	His	Ser	Glu	Val	Gln	Leu	Gln	Gln	Ser	Gly	Pro	Glu	Leu	Val	Lys	
			20					25					30			

cct	gga	gct	tca	atg	aag	ata	tcc	tgc	aag	gct	tct	gtt	tac	tca	ttc	144
Pro	Gly	Ala	Ser	Met	Lys	Ile	Ser	Cys	Lys	Ala	Ser	Val	Tyr	Ser	Phe	
		35					40					45				

act	ggc	tac	acc	atg	aac	tgg	gtg	aag	cag	agc	cat	gga	cag	aac	ctt	192
Thr	Gly	Tyr	Thr	Met	Asn	Trp	Val	Lys	Gln	Ser	His	Gly	Gln	Asn	Leu	
	50					55					60					

gag	tgg	att	gga	ctt	att	aat	cct	tac	aat	ggt	ggt	act	agc	tac	aac	240
Glu	Trp	Ile	Gly	Leu	Ile	Asn	Pro	Tyr	Asn	Gly	Gly	Thr	Ser	Tyr	Asn	
65					70					75					80	

cag	aag	ttc	aag	ggg	aag	gcc	aca	tta	act	gta	gac	aag	tca	tcc	aac	288
Gln	Lys	Phe	Lys	Gly	Lys	Ala	Thr	Leu	Thr	Val	Asp	Lys	Ser	Ser	Asn	
				85					90					95		

aca	gcc	tac	atg	gag	ctc	ctc	agt	ctg	aca	tct	gcg	gac	tct	gca	gtc	336
Thr	Ala	Tyr	Met	Glu	Leu	Leu	Ser	Leu	Thr	Ser	Ala	Asp	Ser	Ala	Val	
			100					105						110		

tat	tac	tgt	aca	aga	cgg	ggg	ttt	cga	gac	tat	tct	atg	gac	tac	tgg	384
Tyr	Tyr	Cys	Thr	Arg	Arg	Gly	Phe	Arg	Asp	Tyr	Ser	Met	Asp	Tyr	Trp	
		115					120					125				

ggt	caa	gga	acc	tca	gtc	acc	gtc	tcc	tca							414
Gly	Gln	Gly	Thr	Ser	Val	Thr	Val	Ser	Ser							
	130						135									

<210> 85

<211> 138

<212> PRT

<213> Artificial Sequence

<220>

<223> Sequence of CMV light chain variable region

<400> 85

Met Gly Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
1 5 10 15

Val His Ser Glu Val Gln Leu Gln Gln Ser Gly Pro Glu Leu Val Lys  
20 25 30

Pro Gly Ala Ser Met Lys Ile Ser Cys Lys Ala Ser Val Tyr Ser Phe  
35 40 45

Thr Gly Tyr Thr Met Asn Trp Val Lys Gln Ser His Gly Gln Asn Leu  
50 55 60

Glu Trp Ile Gly Leu Ile Asn Pro Tyr Asn Gly Gly Thr Ser Tyr Asn  
65 70 75 80

Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Asn  
85 90 95

Thr Ala Tyr Met Glu Leu Leu Ser Leu Thr Ser Ala Asp Ser Ala Val  
100 105 110

Tyr Tyr Cys Thr Arg Arg Gly Phe Arg Asp Tyr Ser Met Asp Tyr Trp  
115 120 125

Gly Gln Gly Thr Ser Val Thr Val Ser Ser  
130 135

<210> 86

<211> 108

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of Wol light chain

<400> 86

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly  
1 5 10 15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Gly  
20 25 30



Tyr Leu Gly Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu  
35 40 45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile Pro Asp Arg Phe Ser  
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Arg Leu Glu  
65 70 75 80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Tyr Gly Ser Leu Gly  
85 90 95

Arg Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys  
100 105

<210> 87

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of CMV light chain

<400> 87

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly  
1 5 10 15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Ser Asn Asn  
20 25 30

Leu His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile  
35 40 45

Lys Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Asp Arg Phe Ser Gly  
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Arg Leu Glu Pro  
65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Ser Asn Ser Trp Pro His  
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys

100

105

&lt;210&gt; 88

&lt;211&gt; 122

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Amino acid sequence of Wol heavy chain

&lt;400&gt; 88

Gln Val Gln Leu Met Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
 1 5 10 15

Ser Val Arg Val Ser Cys Lys Thr Ser Gly Gly Thr Phe Val Asp Tyr  
 20 25 30

Lys Gly Leu Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
 35 40 45

Gly Gln Ile Pro Leu Arg Phe Asn Gly Glu Val Lys Asn Pro Gly Ser  
 50 55 60

Val Val Arg Val Ser Val Ser Leu Lys Pro Ser Phe Asn Gln Ala His  
 65 70 75 80

Met Glu Leu Ser Ser Leu Phe Ser Glu Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Glu Tyr Gly Phe Asp Thr Ser Asp Tyr Tyr Tyr Tyr Tyr Trp  
 100 105 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
 115 120

&lt;210&gt; 89

&lt;211&gt; 119

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

<220>

<223> Amino acid sequence of CMV heavy chain

<400> 89

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Gly Tyr  
20 25 30

Thr Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

Gly Leu Ile Asn Pro Tyr Asn Gly Gly Thr Ser Tyr Asn Gln Lys Phe  
50 55 60

Lys Gly Arg Val Thr Val Ser Leu Lys Pro Ser Phe Asn Gln Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Phe Ser Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Thr Arg Arg Gly Phe Arg Asp Tyr Ser Met Asp Tyr Trp Gly Gln Gly  
100 105 110

Thr Leu Val Thr Val Ser Ser  
115

<210> 90

<211> 129

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 90

tagatctaga ccaccatggt tttcacacct cagatactag gactcatgct cttctggatt 60

tcagcctcca gaggtgaaat tgtgctaact cagtctccag gcaccctaag cttatcacccg 120

ggagaaagg 129

<210> 91

<211> 128

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 91

tagacagaat tcacgcgtac ttgataagta gacgtggagc ttgtccaggt ttttgttggt 60

accagtgtag gttggttgcta atactttggc tggccctgca ggaaagtgta gccctttctc 120

ccggtgat 128

<210> 92

<211> 113

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 92

aagagaattc acgcgtccca gtccatctct ggaatacccg ataggttcag tggcagtgga 60

tcagggacag atttcactct cacaataagt aggctcgagc cggaagattt tgc 113

<210> 93

<211> 116

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 93

tagatctaga gttgagaaga ctacttacgt tttatattcta ccttggtccc ttgtccgaac 60

gtatgaggcc aactgttact ctgttgacaa taatacacag caaaatcttc cggtc 116

<210> 94  
 <211> 134  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligo  
 <400> 94  
 tataatctaga ccaccatggg atggagctgg atctttctct tcctcctgtc aggaactgca 60  
 ggtgtccact ctcaagtcca actggtacag tctggagctg aggttaaaaa gcctggaagt 120  
 tcagtaagag ttcc 134

<210> 95  
 <211> 134  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligo  
 <400> 95  
 tataataggta ccaccattgt aaggattaat aagtccaacc cactcaagtc cttttccagg 60  
 tgcctgtctc acccagttca tgggtataccc agtgaatgag tatccggaag ctttgcagga 120  
 aactcttact gaac 134

<210> 96  
 <211> 116  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Oligo  
 <400> 96  
 tataataggta ccagctacaa ccagaagttc aagggcagag ttacagtttc tttgaagcct 60

tcatttaacc aggcctacat ggagctcagt agtctgtttt ctgaagacac tgcagt 116

<210> 97

<211> 116

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 97

tatatctaga ggccattctt acctgaggag acggtgacta aggttccttg accccagtag 60

tccatagaat agtctcgaaa ccccggtctt gtacagtaat agactgcagt gtcttc 116

<210> 98

<211> 408

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence of light chain of AF2 antibody

<220>

<221> CDS

<222> (1)..(408)

<223>

<400> 98

atg	cat	cag	acc	agc	atg	ggc	atc	aag	atg	gaa	tca	cag	act	ctg	gtc	48
Met	His	Gln	Thr	Ser	Met	Gly	Ile	Lys	Met	Glu	Ser	Gln	Thr	Leu	Val	
1				5				10						15		

ttc	ata	tcc	ata	ctg	ctc	tgg	tta	tat	ggc	gct	gat	ggg	aac	att	gtt	96
Phe	Ile	Ser	Ile	Leu	Leu	Trp	Leu	Tyr	Gly	Ala	Asp	Gly	Asn	Ile	Val	
			20					25					30			

atg	acc	caa	tct	ccc	aaa	tcc	atg	tac	gtg	tca	ata	gga	gag	agg	gtc	144
Met	Thr	Gln	Ser	Pro	Lys	Ser	Met	Tyr	Val	Ser	Ile	Gly	Glu	Arg	Val	
		35					40					45				

acc	ttg	agc	tgc	aag	gcc	agt	gaa	aat	gtg	gat	act	tat	gta	tcc	tgg	192
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Thr	Leu	Ser	Cys	Lys	Ala	Ser	Glu	Asn	Val	Asp	Thr	Tyr	Val	Ser	Trp		
50						55					60						
tat	caa	cag	aaa	cca	gag	cag	tct	cct	aaa	ctg	ctg	ata	tat	ggg	gca	240	
Tyr	Gln	Gln	Lys	Pro	Glu	Gln	Ser	Pro	Lys	Leu	Leu	Ile	Tyr	Gly	Ala		
65					70					75					80		
tcc	aac	cgg	tac	act	ggg	gtc	cac	gat	cgc	ttc	acg	ggc	agt	gga	tct	288	
Ser	Asn	Arg	Tyr	Thr	Gly	Val	His	Asp	Arg	Phe	Thr	Gly	Ser	Gly	Ser		
				85					90					95			
gca	aca	gat	ttc	act	ctg	acc	atc	agc	agt	gtg	cag	gct	gaa	gac	ctt	336	
Ala	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser	Ser	Val	Gln	Ala	Glu	Asp	Leu		
			100					105					110				
gca	gat	tat	cac	tgt	gga	cag	agt	tac	aac	tat	cca	ttc	acg	ttc	ggc	384	
Ala	Asp	Tyr	His	Cys	Gly	Gln	Ser	Tyr	Asn	Tyr	Pro	Phe	Thr	Phe	Gly		
		115					120					125					
tcg	ggg	aca	aag	ttg	gaa	ata	aag									408	
Ser	Gly	Thr	Lys	Leu	Glu	Ile	Lys										
	130					135											

<210> 99

<211> 136

<212> PRT

<213> Artificial Sequence

<220>

<223> Sequence of light chain of AF2 antibody

<400> 99

Met	His	Gln	Thr	Ser	Met	Gly	Ile	Lys	Met	Glu	Ser	Gln	Thr	Leu	Val
1				5					10					15	

Phe	Ile	Ser	Ile	Leu	Leu	Trp	Leu	Tyr	Gly	Ala	Asp	Gly	Asn	Ile	Val
			20					25					30		

Met	Thr	Gln	Ser	Pro	Lys	Ser	Met	Tyr	Val	Ser	Ile	Gly	Glu	Arg	Val
		35					40					45			

Thr	Leu	Ser	Cys	Lys	Ala	Ser	Glu	Asn	Val	Asp	Thr	Tyr	Val	Ser	Trp
50						55					60				

Tyr	Gln	Gln	Lys	Pro	Glu	Gln	Ser	Pro	Lys	Leu	Leu	Ile	Tyr	Gly	Ala
65					70					75					80

Ser	Asn	Arg	Tyr	Thr	Gly	Val	His	Asp	Arg	Phe	Thr	Gly	Ser	Gly	Ser
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

	85		90		95
Ala Thr Asp Phe Thr Leu Thr Ile Ser Ser Val Gln Ala Glu Asp Leu					
	100		105		110
Ala Asp Tyr His Cys Gly Gln Ser Tyr Asn Tyr Pro Phe Thr Phe Gly					
	115		120		125
Ser Gly Thr Lys Leu Glu Ile Lys					
	130		135		

<210> 100

<211> 456

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence of heavy chain of AF2 antibody

<220>

<221> CDS

<222> (1)..(456)

<223>

<400> 100

atg aca tca ctg ttc tct cta cag tta ccg agc aca cag gac ctc gcc	48
Met Thr Ser Leu Phe Ser Leu Gln Leu Pro Ser Thr Gln Asp Leu Ala	
1 5 10 15	

atg gga tgg agc tgt atc atc ctc ttc ttg gta gca aca gct aca ggt	96
Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly	
20 25 30	

gtc ctc tcc cag gtc caa ctg cag cag cct ggg gct gac ctt gtg atg	144
Val Leu Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Asp Leu Val Met	
35 40 45	

cct ggg gct cca gtg aag ctg tcc tgc ttg gct tct ggc tac atc ttc	192
Pro Gly Ala Pro Val Lys Leu Ser Cys Leu Ala Ser Gly Tyr Ile Phe	
50 55 60	

acc agc tcc tgg ata aac tgg gtg aag cag agg cct gga cga ggc ctc	240
Thr Ser Ser Trp Ile Asn Trp Val Lys Gln Arg Pro Gly Arg Gly Leu	
65 70 75 80	

gag tgg att gga agg att gat cct tcc gat ggt gaa gtt cac tac aat	288
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Glu	Trp	Ile	Gly	Arg	Ile	Asp	Pro	Ser	Asp	Gly	Glu	Val	His	Tyr	Asn	
				85					90					95		
caa	gat	ttc	aag	gac	aag	gcc	aca	ctg	act	gta	gac	aaa	tcc	tcc	agc	336
Gln	Asp	Phe	Lys	Asp	Lys	Ala	Thr	Leu	Thr	Val	Asp	Lys	Ser	Ser	Ser	
			100					105					110			
aca	gcc	tac	atc	caa	ctc	aac	agc	ctg	aca	tct	gag	gac	tct	gcg	gtc	384
Thr	Ala	Tyr	Ile	Gln	Leu	Asn	Ser	Leu	Thr	Ser	Glu	Asp	Ser	Ala	Val	
			115				120					125				
tat	tac	tgt	gct	aga	gga	ttt	ctg	ccc	tgg	ttt	gct	gac	tgg	ggc	caa	432
Tyr	Tyr	Cys	Ala	Arg	Gly	Phe	Leu	Pro	Trp	Phe	Ala	Asp	Trp	Gly	Gln	
			130			135					140					
ggg	act	ctg	gtc	act	gtc	tct	gca									456
Gly	Thr	Leu	Val	Thr	Val	Ser	Ala									
145					150											

<210> 101

<211> 152

<212> PRT

<213> Artificial Sequence

<220>

<223> Sequence of heavy chain of AF2 antibody

<400> 101

Met	Thr	Ser	Leu	Phe	Ser	Leu	Gln	Leu	Pro	Ser	Thr	Gln	Asp	Leu	Ala
1				5					10					15	

Met	Gly	Trp	Ser	Cys	Ile	Ile	Leu	Phe	Leu	Val	Ala	Thr	Ala	Thr	Gly
			20					25					30		

Val	Leu	Ser	Gln	Val	Gln	Leu	Gln	Gln	Pro	Gly	Ala	Asp	Leu	Val	Met
		35				40						45			

Pro	Gly	Ala	Pro	Val	Lys	Leu	Ser	Cys	Leu	Ala	Ser	Gly	Tyr	Ile	Phe
	50					55					60				

Thr	Ser	Ser	Trp	Ile	Asn	Trp	Val	Lys	Gln	Arg	Pro	Gly	Arg	Gly	Leu
65					70					75					80

Glu	Trp	Ile	Gly	Arg	Ile	Asp	Pro	Ser	Asp	Gly	Glu	Val	His	Tyr	Asn
				85					90					95	

Gln	Asp	Phe	Lys	Asp	Lys	Ala	Thr	Leu	Thr	Val	Asp	Lys	Ser	Ser	Ser
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

100	105	110
Thr Ala Tyr Ile Gln Leu Asn Ser Leu Thr Ser Glu Asp Ser Ala Val		
115	120	125
Tyr Tyr Cys Ala Arg Gly Phe Leu Pro Trp Phe Ala Asp Trp Gly Gln		
130	135	140
Gly Thr Leu Val Thr Val Ser Ala		
145	150	
<210> 102		
<211> 107		
<212> PRT		
<213> Artificial Sequence		
<220>		
<223> Amino acid sequence of light chain of Eu antibody		
<400> 102		
Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly		
1	5	10 15
Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Ser Ile Asn Thr Trp		
20	25	30
Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Met		
35	40	45
Tyr Lys Ala Ser Ser Leu Glu Ser Gly Val Pro Ser Arg Phe Ile Gly		
50	55	60
Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro		
65	70	75 80
Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Ser Asp Ser Lys		
85	90	95
Met Phe Gly Gln Gly Thr Lys Val Glu Val Lys		
100	105	
<210> 103		

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of light chain of AF2 antibody

<400> 103

Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly  
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Glu Asn Val Asp Thr Tyr  
20 25 30

Val Ser Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile  
35 40 45

Tyr Gly Ala Ser Asn Arg Tyr Thr Gly Val Pro Ser Arg Phe Ser Gly  
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro  
65 70 75 80

Asp Asp Phe Ala Thr Tyr Tyr Cys Gly Gln Ser Tyr Asn Tyr Pro Phe  
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys  
100 105

<210> 104

<211> 117

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of heavy chain of Eu antibody

<400> 104

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Gly Thr Phe Ser Arg Ser  
20 25 30

Ala Ile Ile Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
35 40 45

Gly Gly Ile Val Pro Met Phe Gly Pro Pro Asn Tyr Ala Gln Lys Phe  
50 55 60

Gln Gly Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Phe Tyr Phe Cys  
85 90 95

Ala Gly Gly Tyr Gly Ile Tyr Ser Pro Glu Glu Tyr Asn Gly Gly Leu  
100 105 110

Val Thr Val Ser Ser  
115

<210> 105

<211> 117

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of heavy chain of AF2 antibody

<400> 105

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ile Phe Thr Ser Ser  
20 25 30

Trp Ile Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
35 40 45

Gly Arg Ile Asp Pro Ser Asp Gly Glu Val His Tyr Asn Gln Asp Phe  
50 55 60

Lys Asp Arg Val Thr Ile Thr Ala Asp Glu Ser Thr Asn Thr Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Gly Phe Leu Pro Trp Phe Ala Asp Trp Gly Gln Gly Thr Leu  
100 105 110

Val Thr Val Ser Ser  
115

<210> 106

<211> 115

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 106

ttttttctag accaccatgg agaccgatac cctcctgcta tgggtcctcc tgctatgggt 60

cccaggatca accggagata ttcagatgac ccagtctccg tcgaccctct ctgct 115

<210> 107

<211> 120

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 107

ttttaagctt gggagctttg cctggcttct gctgatacca ggatacataa gtatccacat 60

tttcactggc cttgcagggtt atggtgaccc tatccccgac gctagcagag agggtcgacg 120

<210> 108

<211> 118

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 108

ttttaagctt ctaatttatg gggcatccaa ccggtacact ggggtacctt cacgcttcag 60

tggcagtgga tctgggaccg atttcaccct cacaatcagc tctctgcagc cagatgat 118

<210> 109

<211> 120

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 109

ttttttctag agcaaaagtc tacttacgtt tgacctccac cttgggtccc tgaccgaacg 60

tgaatggata gttgtaactc tgtccgcagt aataagtggc gaaatcatct ggctgcagag 120

<210> 110

<211> 114

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 110

tttttctaga ccaccatggg atggagctgg atctttctct tcctcctgtc aggtaccgcg 60

ggcgtgcact ctcagggtcca gcttgtccag tctggggctg aagtcaagaa acct 114

<210> 111

<211> 121

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 111

ttttgaattc tcgagaccct gtccaggggc ctgccttacc cagtttatcc aggagctagt 60

aaagatgtag ccagaagctt tgcaggagac cttcacggag ctcccagggt tcttgacttc 120

a 121

<210> 112

<211> 137

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 112

ttttgaattc tcgagtggat gggaaggatt gatccttccg atggtgaagt tcactacaat 60

caagatttca aggaccgtgt tacaattaca gcagacgaat ccaccaatac agcctacatg 120

gaactgagca gcctgag 137

<210> 113

<211> 134

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligo

<400> 113

tttttctaga ggttttaagg actcacctga ggagactgtg accagggttc cttggcccca 60

gtcagcaaac cagggcagaa atcctcttgc acagtaatag actgcagtgt cctctgatct 120

caggctgctc agtt 134